

Remarks: Please Read the question more than once to fully understand it before you start solving.

- 1- Draw a block diagram showing the main components of a general-purpose image processing system.

(4 Marks)

- 2- Differentiate between:

- Radiance and Luminance of a chromatic light source.
- Illumination and reflectance of an object when lighting it.

(4 Marks)

- 3- Consider the image segment shown below.

Let  $V = \{1, 2\}$  and compute the lengths of the shortest 4-, 8-, and  $\infty$ -path between  $p$  and  $q$ . If a particular path does not exist between these two points, explain why.



(4 Marks)

- 4- Determine if each of the following statements is true or not. If it is not, modify it to become true.

- Magnetic disks are used in short-term storage during image processing.
- If two pixels are 4-adjacent then they are 8-adjacent.
- Infrared ray imaging are typically used in exploring minerals and oil.
- Image quantization is determined by the sensor arrangement used to generate the image.
- In digital image processing, when dealing with image transform, it is always possible to formulate the transform using matrix multiplications.
- In digital image processing spatial operations are usually more computationally intensive compared to transform operations. *المكثف*
- Negative third moment of an image means pixel values have bias to values smaller than the mean.

(4 Marks)

With my best wishes